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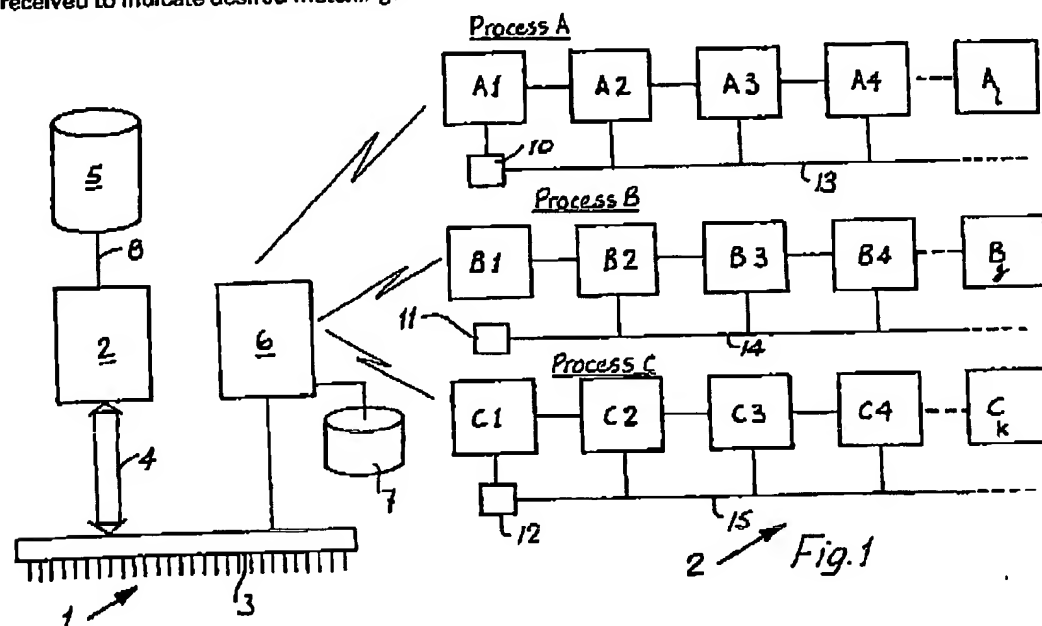
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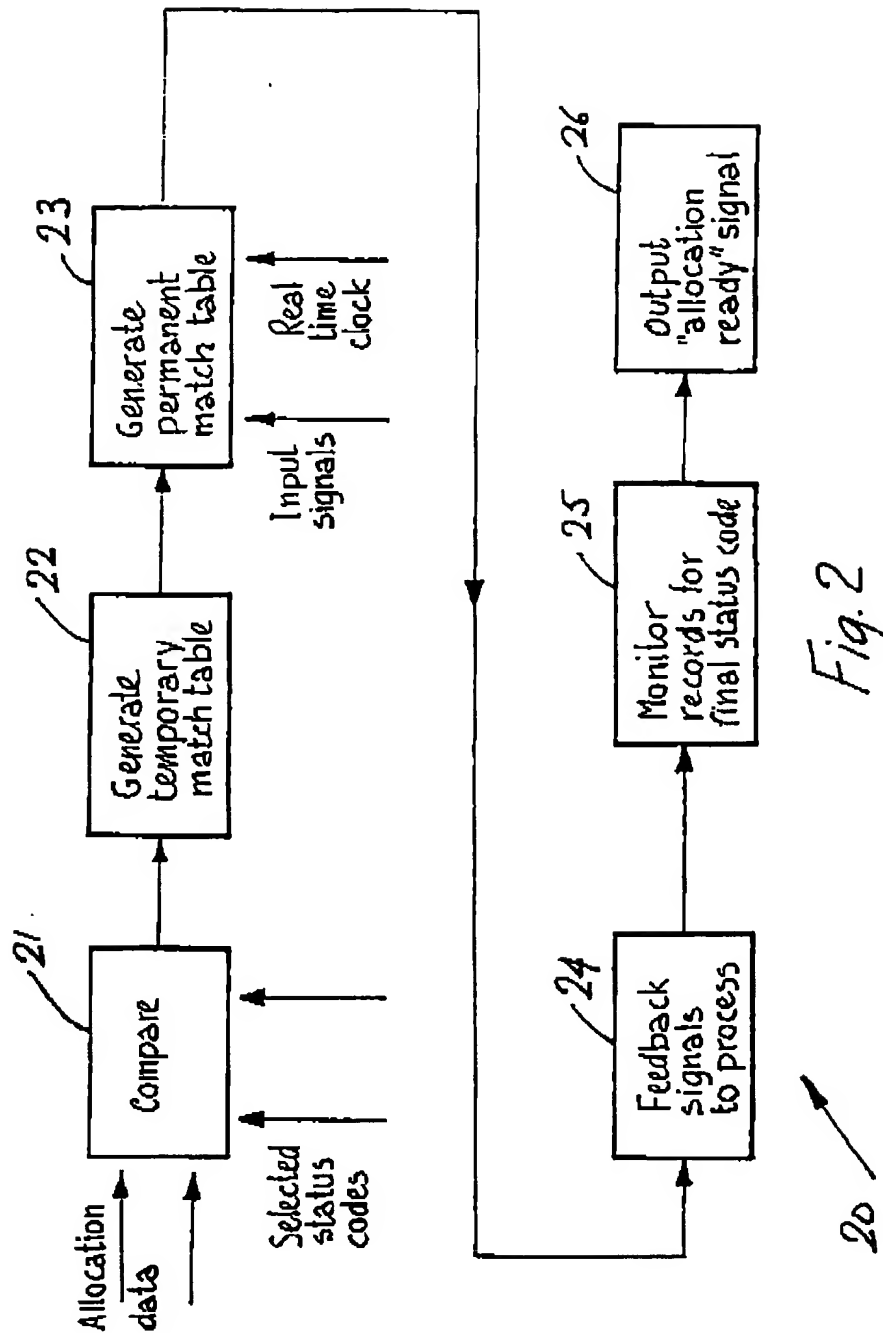
(54) A process control method

(57) A process control method carried out by a host process controller (2) and local process controllers (10, 11 and 12) is disclosed. The host process controller (2) generates a master file, and a sub-file associated with each process. The master file is transmitted initially to the relevant local process controller (10, 11 and 12). The local process controller automatically updates the file to indicate production progress. This includes updating a status code field for each record which indicates the production status of each individual product. The host process controller (2) receives allocation data via an input/output interface (3) and reads the file at periodic intervals to generate a temporary match table which includes allocation possibilities for end products to destinations. A permanent match table is generated after a pre-set time period and further input signals have been received to indicate desired matching.



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beginning of the processes to the end. This is to optimise the process resources.

According to the invention, there is provided a process control method carried out by a host process controller connected to a storage device, a routing device and to a bi-directional link connecting it to a set of input/output devices, the routing device being connected to a modulation/demodulation circuit for remote communication with a plurality of local process controllers linked to operation stations of an associated process, the method comprising steps of:-

the host process controller generating and storing in a storage device a master file associated with the processes, the file having a plurality of records each associated with a product being produced by a process, wherein each record includes a status code field for storage of a status code indicating the current operation being performed in the process for that product, and a process identifier field;

the host process controller reading process identifier fields and automatically generating sub-files of the master file, each associated with a particular process and transmitting the sub-file to the relevant local process controller via the routing device;

the routing device writing the sub-file data to an associated storage device in parallel with re-transmission to the relevant local process controller;

each local process controller continuously monitoring operations in the associated process and automatically updating the master file stored locally, and the master

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receiving signals from the input/output interfaces during a pre-set time period to cross-match the end products with destinations and subsequently generating a permanent match table according to valid selections.

Preferably, the host process controller communicates with the routing device in slave terminal emulation mode, and the communications circuit carries out parallel operations on the data in a non-invasive manner.

In another embodiment, the routing device comprises a programmable interpreter circuit and a random access memory circuit, and the method comprises the additional steps of the communications device carrying out report generation operations according to criteria received and stored for the interpreter circuit.

In a further embodiment, the storage device connected to the routing device is dynamically partitioned into sections, there being a section associated with each process.

The invention will be more clearly understood from the following description of preferred embodiments thereof, given by way of example only with reference to the accompanying drawings in which:-

Fig. 1 is a diagram showing a number of processes and a process control apparatus of the invention; and

Fig. 2 is a flow diagram showing a portion of a process control method of the invention.

Referring to the drawings, and initially to Fig. 1, a process control system 1 is shown for control of three

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100 ports which are designated for communication with intelligent or slave processors, including printers. The controller 2 is programmed to activate an on-board emulation circuit which has the capability to communicate
5 with an intelligent processor as if it were a slave device.

One of the interfaces 3 is an intelligent routing or communications device 6, which comprises an Intel 486 DX™ processor operating at 25 MHz. The device 6 has 16 MB of
10 on-board RAM and a 320 MB fixed disk 7. An important aspect of the invention is that the fixed disk is partitioned into several, in this case six, logical drives. Each of the drives is associated with one of the processes A, B and C, or with a separate processing
15 function. This partitioning is dynamic because the processor assigns different sets of memory locations, depending on the extent of activity of the processes A, B and C. Another important feature is that the host process controller 2 in its emulation mode treats the device 6 as
20 a slave terminal for communications, while transparently to the controller 2, the on-board processor has sole access to data on the fixed disk of the device 6. This limits the processing power required of the processor 2 by optimising use of processing capacity of the routing
25 device 6 to change the data communicated with the controller 2 as appropriate.

The process controller 2 is connected to a bank 5 of fixed disks of 5 GB capacity. This stored data may only be accessed by the controller 2 because there is a direct
30 connection by way of a link 8, and no circuits are provided for access by an interface 3, including the routing device 6. The bank 5 has a pre-set partition structure with set memory locations for each process A, B

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associated local controller 10, 11 or 12. While doing this, the device 6 "transparently" to the controller 2 writes the data in parallel to its own fixed disk at the relevant logical drive.

5 During operation of a process the local controller 10, 11 or 12 automatically transmits update signals regarding the production operations to the sub-file stored locally and via a modem to the process controller 2 which, in turn updates the table in the storage device 5. The device 6
10 also updates its data records during the re-transmission operations. This is possible because the data transmitted is in "flat" format such as ASCII.

The important point is that the status code field is updated at a regular basis in real-time as the new
15 operations are being carried out on the relevant product.

At regular intervals, the process controller 2 is activated by an input/output interface 3 to carry out a batch process. This process is illustrated in Fig. 2 and it involves in step 21 receiving allocation data at an
20 interface 3 which includes values for parameters associated with the destination of the end product. The allocation data will specify required values for product parameters. For example, where the end product is a motor car, the allocation data for one particular end product
25 would specify that the car must be of a particular make and colour, and engine size etc. Also in step 21, the process controller 2 reads the status code fields in a selected number of records. The records are selected according to the particular process involved. Finally,
30 the step 21 involves the process controller 2 comparing the allocation data with the status code data and other data in the record from which the status codes are retrieved to generate a temporary match file in step 22.

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When the last of the operations Ai Bj or Ck has been carried out, this is signalled to the process controller 2 which automatically outputs an "allocation ready" signal via the input/output interface 3 to indicate that the processes as has been completed and the end product is ready for collection by the user.

The communications device 6 also includes a programmable interpreter circuit which is constructed to sort all records in the master file according to variable criteria which may be inputted from another interface 3, or the keyboard of the device 6. Because of the very large random access memory capacity of the device 6, fast viewing of selected contents of the master file may take place. This is important in helping to provide information in the form of reports at an early stage regarding process status so that problems may be averted at an early stage. This processing work is of course carried out independently of the controller 2 and accordingly its operations are not delayed. Of course, the controller 2 communicates with the device 6 from time to time bypassing the emulation circuit to retrieve output files if these are required for use in process control.

The invention is not limited to the embodiments hereinbefore described, but may be varied in construction and detail.

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the host process controller receiving allocation data from an input/output interface to indicate parameters for destinations of products being produced by the processes;

5 at periodic time intervals, the host process controller carrying out a batch process comprising the steps of:-

10 retrieving parameter values from records associated with a set of products, retrieving the status codes for these records, and comparing the allocation data with this data in order to match an end product with a destination;

feeding back signals to the relevant local process controllers to indicate allocation of products with destinations; and

15 each local process controller controlling the associated process according to the feedback signals received.

20 2. A method as claimed in claim 1, wherein the host process controller allocates end products to destinations by carrying out the intermediate steps of:-

25 generating a temporary match file which includes a list of possible destinations for each end product selected according to essential and non-essential parameter values of the associated record; and

receiving signals from the input/output interfaces during a pre-set time period to cross-match the

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 Examiner's report to the Comptroller under Section 17
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Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant
 following a search in respect of
 Claims :-
 1-6

(ii) WPI

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Category	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

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